AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

Please insert the following heading beginning at page 1, after line 1:

TECHNICAL FIELD

Please insert the following heading beginning at page 1, after line 6:

BACKGROUND

Please insert the following heading beginning at page 4, after line 15:

SUMMARY

Please amend the paragraph beginning at page 4, line 17, as follows;

The present invention has been made in order to solve these and other problems associated with the prior art. An electric circuit breaker according to an example, non-limiting embodiment ~~of the present invention~~ comprises a switch to be arranged in the electrical circuit which is to be protected against excessive current loads. The circuit breaker furthermore comprises first means for causing said switch to break the electrical circuit in response to a tripping signal. Means are provided for receiving and storing a programmable current threshold command. The circuit breaker detects a current level in the electrical circuit, and processing means are provided for generating said tripping signal depending on said stored current threshold command and said detected current level.

Please amend the paragraph beginning at page 5, line 1, as follows:

This example embodiment of an electric circuit breaker according to the present invention is advantageous in that the load protection characteristics of the circuit breaker ~~are~~ provided are programmable. In this way an electric circuit breaker is obtained which is suitable for a variety of consumers, load levels and network load constraints, without the need to perform replacement work or to keep a large number of different types of circuit breakers available.

Please amend the paragraph beginning at page 9, line 29, as follows:

Further advantageous non-limiting example embodiments ~~of the present invention~~ are defined in the dependent claims.

Please insert the following heading beginning at page 10, before line 1:

BRIEF DESCRIPTION OF THE FIGURES

Please amend the paragraph beginning at page 10, line 1, as follows:

In the following, specific non-limiting example embodiments ~~of the present invention~~ will be described with reference to the accompanying drawings. In the drawings, similar or corresponding elements have been denoted with the same reference signs.

Please amend the paragraph beginning at page 10, line 11, as follows:

Fig. 2 shows a block diagram of a first embodiment of an electric circuit breaker ~~according to the present invention~~;

Please amend the paragraph beginning at page 10, line 15, as follows:

Fig. 3a, b show t-I diagrams to illustrate the operation of embodiments of the electric circuit breaker ~~according to the present invention~~;

Please amend the paragraph beginning at page 10, line 24, as follows:

Fig. 5 shows a second embodiment of an electric circuit breaker ~~according to the present invention~~;

Please amend the paragraph beginning at page 10, line 28, as follows:

Fig. 6 shows a third embodiment of an electric circuit breaker ~~according to the present invention~~;

Please amend the paragraph beginning at page 11, line 6, as follows:

Fig. 8 shows a flow diagram to illustrate the operation of an embodiment of the ~~processing means~~ processor of the electric circuit breaker;

Please amend the paragraph beginning at page 11, line 13, as follows:

Fig. 10 shows a first embodiment of a hardware implementation of the ~~processing means~~processor; and

Please amend the paragraph beginning at page 11, line 16, as follows:

Fig. 11 shows a second embodiment of a hardware implementation of the ~~processing means~~processor.

Please insert the following heading beginning at page 11, after line 18:

DETAILED DESCRIPTION

Please amend the paragraph beginning at page 13, line 4, as follows:

Figure 2 shows a first example embodiment of an electric circuit breaker~~ according to the present invention~~. In the block diagram of Figure 2, reference numeral 1 denotes the electric circuit breaker which is connected between the power supply line 2 and the power supply line 3 shown in Figure 1. The character n across the power supply lines 2 and 3 and other lines in the electric circuit breaker indicates that while for reasons of simplicity a single phase arrangement is shown in the figure, a poly phase design is not different in principle from the single phase design shown in this and other drawings~~ of the15 present invention~~, and that the present description applies to single phase power supply systems (n = 1) as well as to poly phase power supply systems, e.g. n = 3. Reference numeral 11 in Figure 2 denotes a switch connected in series with first means 12 for thermo- magnetically detecting the level of the current I flowing through the power supply line 3. Such a thermomagnetic current detector ~~means~~ 12 ~~are as such~~ is well known in the art, and a detailed description of the thereto-electric current detector 12 is, therefore, not necessary. As indicated by the dotted line in Fig. 2, the thermo-magnetic current detector ~~means~~ 12 is mechanically coupled with the switch 11 in order to cause the switch 11 to break the electrical circuit established by the power supply line 3 and its connected electrically loads, in short the electrical circuit 3, if the current I flowing in the electrical circuit 3 exceeds a predetermined rated current. This predetermined rated current is determined by the design of the thermo-magnetic current detector 12. This element 12 typically comprises, e.g., a resistive element not shown in Figure 2, which will change its temperature in accordance with the current

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load I. A bi-metal arrangement can conventionally be used to transform the change of temperature into a mechanical displacement which is then taken to trip the switch 11 and break the electrical circuit 3. The current detector 12 furthermore comprises an electromagnetic current ~~detection means~~ detector mechanically coupled with the switch 11, as indicated by the dotted line in Figure 2. ~~These~~ The electromagnetic current ~~detection means~~ detector can be implemented, e.g., by ~~means of~~ a coil connected in series with the switch 11, such that an electromagnetic force is generated by that coil in accordance with the level, of current I flowing in the electric circuit 3. If this magnetic force generated by the current detector 12 exceeds a predefined force threshold determined by the design of the current detector 12 and/or the switch 11, this will cause the switch 11 to break the electric circuit 3. L denotes an externally accessible lever L to enable a user to manually trip the switch 11. A variety of designs of the switch 11, the thermo-magnetic current detector 12 as well as the electrical and mechanical coupling between the elements 11 and 12 ~~is as such well~~ are known ~~in the art and suitable for the present invention~~.

Please amend the paragraph beginning at page 14, line 30, as follows:

Reference numeral 15 denotes a ~~second means~~ current detector for detecting the level of current I flowing in the electrical circuit 3. In Figure 2, the ~~means~~ current detector 15 for detecting the current level I is shown to be connected in series with the switch 11 and the thermo-magnetic current detection means 12. R denotes a resistive element in series with the electric circuit 3. Reference numeral 151 denotes an amplifier ~~means~~ for detecting the voltage drop occurring across the resistive element R in proportion with the current level I, and outputting a corresponding current level detection signal CL. At this stage it is important to note that there exists a variety of well known current detection circuits and techniques, and the specific implementation depicted in

Figure 2 shall not be construed to limit the current ~~detection means~~ detector 15 to the implementation shown. As an alternative to the shunt resistor R it would also be possible to adopt a current transformer, e.g. realized by ~~means of~~ an additional winding magnetically coupled with a coil in the current detector 12 which generates the magnetic force for tripping the switch 11 in case of excessive current levels I. This additional winding together with ~~said~~ the coil ~~will constitute~~ constitutes a transformer in order to implement the current detector 15. Other possibilities of implementing the current detector 15 comprise hall effect devices, magneto resistors and Rogosky coils, all of them being ~~well~~-known ~~as such to be~~ and suitable for the ~~design of~~ current ~~detection means~~detector 15.

Please amend the paragraph beginning at page 15, line 28, as follows:

Reference numeral 13 denotes a ~~means~~ triggering device for causing the switch 11 to break the electrical circuit 3 in response to a tripping signal 14. The ~~means~~ triggering device 13 preferably comprises an electromagnetic coil for magnetizing a movable member made from soft iron in accordance with the tripping signal 14. Upon magnetization, a magnetic force will be exerted upon the soft iron member in the element 13. This member is mechanically coupled with the switch 11, as indicated by the dotted line in Figure 2, such that in response to the tripping signal 14, the element 13 will cause the switch 11 to break the electrical circuit 3. The element 13 can be implemented in a variety of ways in order to achieve the desired function, to trip the switch 11 in response to a tripping signal 14. An alternative implementation of the element 13 exploits the ~~well~~ known effect of magnetostriction and comprises a member made from magnetostrictive material which is subjected to a 15 magnetic field generated by a coil in the element 13 which receives the tripping signal 14, such that upon this tripping signal 14, the magnetostrictive element will change

its mechanical dimensions. This element is mechanically coupled to the switch 11, such that the switch 11 will trip upon the application of the tripping signal 14 to the element 13.

Please amend the paragraph beginning at page 16, line 23, as follows:

Reference numeral 17 denotes a ~~means~~ receiver for receiving a programmable current threshold command CC. This current threshold command is an external command, that is a command not generated autonomously by the electric circuit breaker 1. This current threshold command CC is received by a suitable communication interface IF in the ~~means~~ receiver 17 and then passed on to a memory MEM wherein the received current threshold command can be stored. The communication interface IF can be a power line communication interface for receiving current threshold commands CC through the power supply line 2 and the LV network connected to the power supply line 2. The communication interface IF can also be designed to receive current threshold commands CC through a standard communication interface like RF 232 or USB or some kind of proprietary wire based or infrared or blue tooth interface for communication with a hand held programming device or a personal computer (PC). Alternatively or in addition, the communication interface IF can comprise a key pad for receiving current threshold commands CC through manual user input, preferably in encrypted form or subject to successful user authentication in order to .avoid an unauthorized or illegal access to the means 17 for receiving programmable current threshold commands.

Please amend the paragraph beginning at page 17, line 17, as follows:

Reference numeral 16 denotes a data processor ~~processing means~~ which receive information CL regarding the detected current level from the current ~~detection means~~ detector 15, and which

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~~processing means~~ processor 16 furthermore ~~receive~~ receives information about the current threshold command stored in the memory MEM of the current threshold command ~~receiving and storing means~~ receiver 17. The ~~processing means~~ processor 16 outputs the tripping signal 14 as a result of processing operations which depend upon the input of the current level information CL and the current threshold command stored in the memory MEM, and preferably also depending upon temporal characteristics of the detected current level CL, as will be explained in greater detail further below. The ~~processing means~~ processor 16 may be implemented in hardware or by ~~means of~~ suitably programming a micro controller. The ~~processing means~~ processor 16 also comprises driver circuitry to drive the element 13, specific example embodiments of which will be shown below. If a micro controller is adopted for implementing the ~~processing means~~ processor 16, the micro controller can also take over at least some of the functions of the current threshold command ~~receiving and storing means~~ receiver 17. Embedded micro controller solutions are available on the market, comprising ~~on chip~~ on-chip interfaces which can be used to implement the command 10 receiving interface IF of the element 17.

Please amend the paragraph beginning at page 18, line 12, as follows:

In order to explain the operations performed by the ~~processing means~~ processor 16 in greater detail by way of example, reference will be made ~~in the following~~ to the diagram shown in Figure 3a.

Please amend the paragraph beginning at page 18, line 25 as follows:

In Figure 3a, reference numeral 31 denotes a first section of a curve representing a functional relation between current levels in a current interval between I_R and I_2 and the associated response time. Reference numeral 32 denotes a second section of the curve for current levels above I_2. The

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curve 31, 32 describes the behaviour of the thermo-magnetic current detector 12, I_R denoting the rated current of the current detector 12. Curve sections 331 to 333 for current intervals between I_3. I_4, I_5, respectively on the one hand and I1, on the other hand, as well as the curve section 334 for currents between I_1 and I_2, describe the behaviour of the current detector 15, ~~processing means~~ processor 16 and ~~triggering means~~ trigger device13. In the following, the operation of the circuit breaker shown in Figure 2 will be explained with reference to these curves shown in Figure 3a.

Please amend the paragraph beginning at page 19, line 12, as follows:

In this embodiment, the electric circuit breaker stores in the memory MEM in the command ~~receiving and storing means~~ receiver 17 a current threshold command CC which identifies one of the curves 331, 332 and 333 associated with respective current thresholds I_3, I_4, I_5, respectively. This current threshold command was previously received from the external through the command interface IF of the electric circuit breaker. In order to explain the operation of the electric circuit breaker, at first an operating condition is assumed, that the load current I through the electric circuit breaker is below the programmed current threshold, say I_4 in Figure 3a, presently stored in the memory MEM. In this case, the processing means 16 will apply a characteristic curve 332 defined by the stored current threshold command 14. Since the current load is below the current threshold I_4, the ~~processing means~~ processor 16 will not generate a tripping signal, and the switch 11 will remain closed such that the current I will continue to flow. Assuming now the occurrence of an overload condition resulting in a current I larger than the programmed current threshold I_4, the ~~processing means~~ processor will process the detected current level reported from current detector 15 in accordance with the programmed current threshold I4 by means of measuring the time for which this overload condition continuously prevails. If the duration of the overload condition

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reaches the response time associated with the detected current level I, as represented by curve 332, the ~~processing means~~ processor will generate the tripping signal 14 which will cause the switch 11 to break the electric circuit and hence, terminate the flow of current in the electric circuit 3. In the example shown in Figure 3a, an overload condition in the interval between I_4 and I_1 will result in a response time between about 200 seconds for current level just above the programmed threshold I4, and about 100 seconds if the current level approaches I_4. In other words, the ~~processing means~~ processor 16 is adapted to generate the tripping signal in response to a detected overload condition in such a way, that the response time also depends on the amount of overload. In the exemplary diagram of Figure 3a, all the three curves 331, 332 and 333 join a curve 334 at the current level I_1. If an overload condition above the threshold I_1 is detected by the current detector 15 in Figure 1, the ~~processing means~~ processor means 16 will generate the tripping signal 14 as soon as the overload condition above the threshold I_1 has prevailed for more than about 1 sec., as represented by the curve section 334. The response times t associated with the various current levels may be predefined, or they may be provided programmable by ~~means of~~ the current threshold command CC.

Please amend the paragraph beginning at page 21, line 5, as follows:

The curve section 31 represents the function of the thermal element in the thermo-magnetic current detector 12 shown in Figure 2. From Figure 3a it is evident, that due to the operation of the ~~processing means~~ processor 16 in conjunction with the current detector 15 and the tripping means 13 as just described, the thermo-magnetic current detector 12 should not get the opportunity to cause the switch 11 to break the electric circuit, because for a given overload condition, the ~~processing means~~ processor 16 will generate the tripping signal 14 with a shorter response time

than the thermal response time depicted by the curve section 31 of the thermo-magnetic current detector 12. In the embodiment shown in Figure, 3a, only for extremely high overload conditions approaching the magnetic force threshold I_2 of the thermo-magnetic current detector 12, the response time of the thermo-magnetic current detector 12 and in particular the response time of the electromagnetic components of that current detector 12, will be shorter than the response time of the ~~processing means~~ processor 16. Accordingly, the thermo-magnetic current detector 12 offers a backup function to make sure that the electric circuit breaker will respond to overload conditions with an interruption of the electric circuit 3 even if a fault occurs in any of the elements 13 to 17 shown in Figure 2.

Please amend the paragraph beginning at page 22, line 1, as follows:

In the specific example shown in Figure 3a, the current threshold I_1 may be predetermined in order to provide a fixed upper current limit. It may coincide with the rated current I_R of the thermo-magnetic current detector 12, because in this example, any load condition above the current level I_R will by virtue of the thermo-magnetic current detector 12 cause the switch 11 to break the electrical circuit 3, unless the ~~processing means~~ processor 16 causes an earlier tripping of the switch 11. It is important to note that this specific example shall not be construed to limit the ~~invention~~ technology in any way. Of course, it is possible to adapt the current thresholds I_1 to I_5 shown in Figure 3 to a variety of different needs in accordance with the particular design ~~without departing from the principles of the present invention~~. It is, however, preferable to program the electric circuit breaker such that the programmed t-I curve remains below the curve sections 31, 32 of the thermomagnetic current detector 12.

Please amend the paragraph beginning at page 22, line 21, as follows:

While the embodiment of Figure 3a provides a single programmable current threshold only, it can be advantageous to adapt the ~~processing means~~ processor 16 such that the current threshold command CC identifies individual t-I curves to be applied by the ~~processing means~~ processor 16 in processing the information about the detected current level CL. The plurality of curves available for selection can be defined in the processing means 16 or in the current threshold command ~~receiving and storing means~~ receiver 17 in the form of tables or in the form of mathematical equations characterizing the set of curves in parameterised form.

Please amend the paragraph beginning at page 23, line 4, as follows:

Figure 3b shows another example of a t-I curve adopted by the ~~processing means~~ processor 16. In this embodiment, not only the current thresholds I_1, I_3, I_4, I_5 are provided programmable, but also the response times tl, t3, t4, t5 associated with the current intervals between adjacent thresholds, as depicted in Figure 3b. In this embodiment, a current threshold command CC contains at least one current threshold Ij and at least one associated response time tj. While all current thresholds I_1, I_3, I_4, I_5 are shown to be less than IR, this is not mandatory. Current thresholds above I_R can be programmed with associated response times below the curve 31, 32 in Fig. 3b.

Please amend the paragraph beginning at page 23, line 18, as follows:

Figure 4 shows an example embodiment of an electric power distribution network comprising central control facilities for generating current threshold commands CC. In Figure 4, elements similar to the elements shown in Figure 1 have been denoted with the same reference signs. With

respect to these elements, reference is made to the description for Figure 1 in order to avoid repetitions.

Please amend the paragraph beginning at page 23, line 27, as follows:

In Figure 4, S denotes a secondary substation for transforming the voltage carried on the medium voltage network MV into the low voltage carried on the low voltage network LV. To this end, the secondary substation S comprises a transformer Ts as described above. CBT denotes a communication ~~means~~ device associated with the secondary substation S. The communication means CBT can generate current threshold commands addressed to individual ones or to specified groups of electric circuit breakers 1 at the consumer premises H1, H2, ..., Hn which are connected to the LV network section supplied by the secondary substation S. Reference numeral 24 denotes a coupling ~~means~~device, e.g. a coupling capacitor, for coupling the current threshold commands CC generated by the communication ~~means~~ device CBT to the power supply line 2 of the LV network. Accordingly, in the embodiment shown in Figure 4, the LV network section supplied by the secondary substation S not only serves to distribute electrical power to the consumers H1, H2, ..., Hn, but also serves as a communication medium for transmitting the current threshold commands CC to individual electric circuit breakers 1. In this embodiment, the communication ~~means~~ device CBT ~~comprise means for detecting~~ detects the present load condition of the network section. The communication ~~means~~ device CBT comprises suitable processing facilities to process the detected load condition, that is the power presently supplied by the secondary substation S to its LV network section, in order to generate appropriate current threshold commands to selected ones or to all electric circuit breakers 1 at the consumer premises H1, H2, ..., Hn of that LV network section. If the overall load condition approaches a current

limit or power limit e.g. of the secondary substation S, the communication ~~means~~ device CBT is programmed to generate current threshold commands and broadcast them via the LV network section to the consumers Hl, H2, ..., Hn of the network section. The electric circuit breakers 1 at the consumer premises receive the broadcast current threshold command and store it in their memory MEM. In this way, as a reaction to a critical load situation in the entire LV network section of the secondary substation S, all electric circuit breakers 1 can lower their current thresholds such that only the consumers presently drawing a large amount of current will be disconnected from the LV network section. In this way, a complete shut off of the entire LV network section can be avoided. If an effected consumer disconnects some of the loads L1, L2, ..., LK from the power supply line 3, he will be able to reconnect to the LV network upon operation of the leaver L of the electric circuit breaker 1. Accordingly, in the embodiment of Figure 4 the communication ~~means~~ device CBT can adaptively control the maximum power which each consumer may draw from the network in accordance with the present overall load conaition, to prevent the occurrence of severe overload conditions which would require the shut down of the entire LV network section. Under light load conditions the CBT will generate appropriate broadcast current threshold commands in order to increase the current thresholds programmed into the electric circuit breakers 1 at the various consumer premises H1, H2, ..., Hn.

Please amend the paragraph beginning at page 25, line 29, as follows:

It can be particularly advantageous to distinguish 30 between different types of consumers. There are some types of consumers, e.g. hospitals, which need to be supplied with electric power in any case. For other types of consumers, e.g. for normal households, it may be assumed that a temporary reduction of the current threshold will have less severe impacts. Accordingly, it may be

advantageous to provide a consumer type indication together with a programmable current threshold command CC from the communication ~~means~~ device CBT, and to store a corresponding predefined type indication in each of the electric circuit breakers in accordance with the type of consumer. This consumer type indication allows that in order to prevent a complete black out under severe load conditions, the CBT will at first lower the current thresholds of such types of consumers which are less dependent on a guarantied subscribed power level, and to gradually extend the reduction of the current thresholds to other types of consumers, if this forms out to be necessary to prevent a complete black out.

Please amend the paragraph beginning at page 26, line 20, as follows:

It is important to note that while this concept has been shown and described with regard to consumers connected to an LV network section supplied by a secondary substation S, the same concept can also be applied in other network portions higher up in the network hierarchy. E.g., electric circuit breakers programmable as described above, can be provided to protect sections of the MV network, with communication ~~means~~ device being located at the primary substations Tp which monitor the present load conditions and which generate appropriate current threshold commands to the electric circuit breakers in the MV network and/or to the electric circuit breakers at the consumer premises supplied by the affected MV network section.

Please amend the paragraph beginning at page 27, line 22, as follows:

Reference numeral 23 in Figure 4 denotes ~~means for~~ connecting the communication ~~means~~ device CBT with central administration and control facilities 21 through a public wireless telecommunication network 20. The central administration and control facilities 21 can be

provided to administrate larger portions of the network in a hierarchical fashion, using the communication means CBT associated with the secondary substations S as an intermediate communication node. The facilities 21 can be used to administrate supply contracts, e.g. regarding the maximum power subscribed by an individual consumer Hi, and to program corresponding current thresholds and/or response times into the electric circuit breaker 1 of consumer Hi in accordance with the contractual provisions agreed with the individual consumer Hi, without the need to-have service staff visit the 20 consumer premises.

Please amend the paragraph beginning at page 27, line 22, as follows:

Figure 5 shows an example embodiment of an electric circuit breaker 1 in the electric power distribution network shown in Figure 4. In the electric circuit breaker 1 of Figure 5, elements similar to the elements shown in Figure 2 have been denoted with the same reference numerals, such that with regard to these elements reference can be made to the description given for Figure 1.

Please amend the paragraph beginning at page 28, line 1, as follows:

In the embodiment of Figure 5, the current threshold command ~~receiving and storing means~~ receiver 17 is adapted to receive the current threshold commands CC via power line communication from the power supply line 2 which connects the consumer Hn to the LV network. Reference numeral 171 denotes a capacitive coupling means for taking the power line communication signals generated by the communication means CBT in Figure 4 from the power supply line 2. These power line communication signals carrying the current threshold commands CC are received by the command interface IF and stored in the current threshold command memory MEM, as described above.

A large variety of ready made products and solutions is available on the market for imlementing power line communication systems. Any of these power line communication solutions can be adopted for transmitting current threshold commands CC to the electric circuit breaker 1, such that a detailed description of power line communication technology may be omitted here.

Please amend the paragraph beginning at page 28, line 21, as follows:

Figure 6 shows a third example embodiment of an electric circuit breaker 1~~-according to the present invention~~. This embodiment differs from the embodiment of Figure 5 in the provision of an energy ~~metering means~~ meter 18 for measuring and counting the energy drawn by the consumer from the power distribution network through the power supply line 2. In the embodiment shown in Figure 6, the energy ~~metering means~~ meter 18 ~~receive~~ receives a current level detection signal CL from the current detector 15. The energy ~~metering means~~ meter 18 calculates the energy from the detected current level CL and the detected supply voltage U and accumulates at least the active energy drawn from the power supply network. The accumulated amount of energy is displayed on a display 19. All other components of the electric circuit breaker 1 of the 5 embodiment of Figure 6 correspond to the components shown in the second embodiment of Figure 5. In this respect, reference is made to the description already given above.

Please amend the paragraph beginning at page 29, line 10, as follows:

Figure 7 shows an advantageous example embodiment of the ~~means~~ trigger device 13 for causing the switch to break the electrical circuit in response to a tripping signal. This embodiment is suitable for any of ~~the~~ circuit breaker embodiments ~~herein described~~. In Figure 7, elements similar to or identical with elements shown in the preceding figures have been denoted with the same reference

numerals. With regard to these elements reference is made to the description given above. In the embodiment of Figure 7, the ~~means~~ trigger device 13 comprises an electromagnetic coil 131 which is connected to receive the tripping signal 14 from the ~~processing means~~ processor 16. The coil 131 magnetizes a movable element 132 which is mechanically coupled to the contacts 111 of the switch 11. Moreover, the movable element 132 is also coupled with the lever L for manually operating the switch 11. Reference numeral 133 denotes an auxiliary switch mechanically coupled with the movable element 132. The auxiliary switch 133 is connected in series with the coil 131, such that the energization of the coil 131 by the tripping signal 14 depends on the state of the auxiliary switch 133. Reference numeral θll denotes a displacement of the movable element 132, e.g. an angle, which is required to open the contacts of the switch 11. Similarly, 0133 denotes a displacement of the movable element 132, e.g. an angle, which is required to open the auxiliary switch 133. According to the embodiment shown in Fig. 7, the switch 11 and the auxiliary switch 133 are constructed such that the displacement 0133 required to open the auxiliary switch 133 is larger than the displacement θ11 required to open the switch 11. When the ~~processing means~~ processor 16 generates a tripping signal 14, this will energize the coil 131 until the displacement of the movable element 132 is large enough to open the auxiliary switch 133. This displacement will then surely be large enough to reliably open the contacts 111 of the switch 11. At the same time it is achieved that a current through the coil 131 will be neither higher nor lower than necessary and will not flow longer than necessary for reliably opening the switch 11. The duration for which the ~~processing means~~ processor 16 generates the tripping signal 14~~,~~ is uncritical.

Please amend the paragraph beginning at page 30, line 22, as follows:

According to an advantageous modification of this embodiment, the mechanical coupling of the lever L with the switch 11 is made dependent on whether the coil 131 is energized or not. If the coil 131 is energized, then the lever 11 is decoupled from the switch 11. To this end an electromagnetic coupling element (not shown) can be provided for selectively coupling or decoupling the lever L from the switch contacts 111. The electromagnetic coupling element can have a movable hook, cam, tappet or any other engagement ~~means~~ device which can be biased e.g. by ~~means of~~ a spring, to mechanically couple the lever L with the contacts 111 of switch 11. The electro magnetic coupling element ~~has means to~~ electro magnetically ~~withdraw~~ withdraws the engagement ~~means~~ device to decouple the lever L from the switch contacts 111 when the coil 131 is energized. When the ~~processing means~~ processor 16 outputs a continuous tripping signal, for instance in response to an external circuit interrupt command (which has caused the switch 11 to break the electrical circuit 3) and a user then tries to move the lever L into the closed position of the switch 11 to reestablish the electrical circuit 3, this will result in that the auxiliary switch 133 will close before the switch 11 can close, due to the fact that because the displacement required to open the auxiliary switch 133 is larger than the displacement required to open the switch 11, the switch 133 will close earlier than switch 11 can close. This will then energize the coil 131 and decouple the lever L from the switch contacts 111 before the switch contacts 111 can close the electrical circuit. The energized coil will furthermore generate a force upon the lever L which is perceivable by the user, to urge the lever back into the open position. On the other hand, if there is no longer a tripping signal from the ~~processing means~~ processor 16, the lever can be moved back into the closed position.

Please amend the paragraph beginning at page 32, line 7, as follows:

Figure 8 shows a flow diagram to illustrate the operation of an example embodiment of the ~~processing means~~processor. In this embodiment, the ~~processing means~~ processor comprises a micro processor and associated program and data memory, as well as input/output port facilities. Such hardware structures are available on the market e.g. in the form of embedded micro controller solutions wherein the micro processor as well as the required peripheral devices 15 like memories and I/O ports are integrated on a single chip. The embodiment shown in Figure 8 is but one of a large variety of possible implementations of the ~~processing means~~ processor 16 in ~~any of the previously described embodiments of~~ the electric circuit breaker 1, as will be readily apparent to those skilled in the art. In this embodiment, the micro processor in the ~~processing means~~ processor 16 is programmed, for example, to perform the flow of operations shown in Figure 8. This flow of operations achieves the processing of the detected current level CL and the generation of the tripping signal 14 depending on a stored programmed current threshold command maintained in the memory MEM, which indicates a programmed current threshold Ij and the associated response time Tj. The flow of Figure 8 implements a retriggerable measurement of the duration of an overload condition when the detected current level CL is above the current threshold Ij, wherein a non-steady overload condition will not lead to the generation of a tripping command 14, as will be explained in the following.

Please amend the paragraph beginning at page 34, line 22, as follows:

Figure 9 shows an advantageous extension which provides a safety check when a tripping signal has been generated, in order to confirm that the detected current level CL has ~~a matter of fact~~ reached zero. In the operation S8 it is checked whether an active tripping signal is present. As soon

as a tripping signal exists (branch Y in the operation S8), a check is made whether the current level CL has reached zero. In the negative case (branch N in the operation S9), the flow proceeds to the operation S10 to set an alarm condition because of the detection of a current level larger than zero despite the generation of a tripping command for the switch 11. This alarm condition can be an audio and/or visual indication at the electric circuit breaker 1. More preferably, the electric circuit breaker 1 comprises means to report this alarm condition to the communication means CBT and/or to the central administration and control facilities 21 which will then take appropriate action.

Please amend the paragraph beginning at page 35, line 11, as follows:

Figure 10 shows a further example embodiment of the current detector 15 and the ~~processing means~~ processor 16 ~~in any of the Figures 2, 5 and 6~~. In the embodiment of Figure 10, reference numeral 152 denotes a current transducer for 15 transducing the current flowing through the power supply line 2. Numeral 153 denotes a converter for performing a root mean square conversion of the current detected by current transducer 152, and to generate a current level detection signal CL. Numeral 163 denotes a filtering and 20 averaging circuit comprising an RC element for averaging and delaying the current level detection signal CL. 164 denotes a circuit for transforming the programmable current threshold into a reference voltage Vref, e.g. by means of using a digital potentiometer, as such well known in the art, which converts the digital current threshold value into a tap position of the potentiometer. Numeral 165 denotes a comparator circuit which compares the output signal of the filtering and averaging circuit 163 with the programmed reference voltage Vref. Numeral 166 denotes a driver circuit, e.g. a MOSFET transistor or bipolar transistor which receives at its gate the output signal from the comparator circuit 165. As soon as the output signal of the circuit 163 exceeds the programmed reference voltage Vref, the comparator

circuit 165 generates a gate signal such that the transistor 166 turns conductive and causes a tripping current to flow through the ~~means~~ device 13 which will then cause the switch 11 to break the electrical circuit. In this non-limiting example embodiment, the elements 163, 164, 165 implement the ~~processing means~~ processor 16 using hardware components.

Please amend the paragraph beginning at page 36, line 12, as follows:

Figure 11 shows yet another non-limiting example embodiment of the current detector 15 and the ~~processing means~~ processor 16. Elements similar to the elements shown in Figure 10 are denoted with the same reference numerals. With respect to these elements reference is made to the description of Figure 10. In Figure 11, numeral 1631 denotes a voltage frequency converter for converting the current level detection signal CL into a corresponding frequency. Numeral 1632 denotes a frequency divider which divides the frequency provided by the current frequency converter 1631 by a factor determined by the programmed current threshold stored in the memory MEM of the electric circuit breaker 1. The frequency divider outputs a divided signal ck for clocking a counter 1651. Numeral 1642 denotes a circuit for converting the programmed time interval associated with the programmed current threshold from the stored digital representation in the memory MEM into a signal for controlling the frequency of an oscillator 1641. The oscillator 1641 outputs a reset signal to the counter 1651 with a frequency in accordance with the programmed time interval Tj. If the output signal of the frequency divider CK occurs with a frequency higher by a given factor than the frequency of the reset signal, the counter 1651 will output an overflow signal to the driver transistor 166 in order to generate the tripping signal.

Please amend the paragraph beginning at page 37, line 8, as follows:

Accordingly, the non-limiting example embodiment shown in Figure 11 implements the ~~processing means~~ processor 16 in hardware such that the ~~processing means~~ processor 16 can generate the tripping signal 14 depending on a stored programmable current threshold command indicating a current threshold Ij and an associated response time interval Tj, and depending on the detecting current level flowing in the electrical circuit 3.

Please amend the paragraph beginning at page 37, line 17, as follows:

The embodiments so far described comprise a switch 11 which can be tripped by the ~~first means~~ triggering device 13 and also by the ~~second means~~ current detector 12 advantageously provided as a back up. The switch 11 can be a mechanical switch with movable contacts 111 to break or close the electric circuit. Alternatively, the switch 11 can be composed of a series connection of a mechanical switch and a solid state switch, e.g. a triac. The mechanical switch is mechanically coupled with the second means 12, and the solid state switch receives a control signal from the ~~first means~~ triggering device 13 in accordance with the tripping signal 14 from the ~~processing means~~ processor 16.

Please amend the paragraph beginning at page 38, line 19, as follows:

While the embodiments described above are based on a detection of the current flowing in the electrical circuit 3, the skilled person will understand that it would be possible to achieve essentially the same effects if in reactive power fed into the electrical circuit 3 is detected. Similarly, the programmable current thresholds described above may define current thresholds or

power thresholds or a suitable complex entity composed of current and power. Whenever the foregoing description refers to the detection of current levels or the programming of current thresholds, the term current is to be understood in this more general sense. Reference signs in the originally filed claims shall not be construed to limit their scope.